

1929) cite among the synonyms *Abies glauca* Roezl, *A. glaucescens* Roezl, *A. Lindleyana* Roezl, *A. Tlapalcatuda* Roezl and their subsequent combinations, but all these names are probably referable to *Pseudotsuga taxifolia* (Poir.) Britt., and are enumerated as doubtful synonyms of *Pseudotsuga Flahaultii* Flous (in Bull. Soc. Hist. Nat. Toulouse 71: 92; Trav. Lab. For. Toulouse, Tome II, vol. IV, art. 2: 60, 1936). Miss Flous' species is apparently only a slight form of the Rocky Mountain Douglas fir, *P. taxifolia* var. *glauca* (Beiss.) Schneid., considered a distinct species by Mayr and by Flous, a subspecies by Schwerin, a forma by Voss and published as a straight trinomial by Sudworth.

Abies Hickeli Flous and Gausson in Bull. Soc. Hist. Nat. Toulouse, 64: 24, fig.; in Trav. Lab. For. Toulouse, I, art. 17: 1, fig. (1932).

FIG. 1, E-I

Arbor: ramuli rubro-brunnei, pulvinis linearibus sulcati, tenuiores, laterales praecipue in sulcis satis hirtelli, robustiores et fructiferi glabrescentes vel glabrae; gemmae ovoideae, obtusae, valde resinosae.

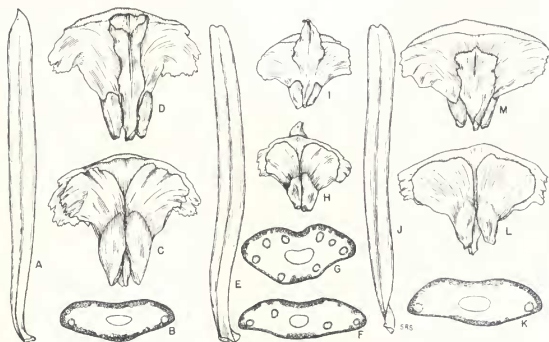


FIGURE 1. *ABIES RELIGIOSA* (HBK.) Schlecht. & Cham. A. Leaf, $\times 3$.— B. Cross-section of leaf, $\times 15$.— C. Scale with seeds, nat. size.— D. Scale with bract, nat. size. — *ABIES HICKELI* Flous & Gauss. E. Leaf, $\times 3$.— F. Cross-section of leaf from a sterile branch, $\times 15$.— G. Cross-section of leaf from a fertile branch, $\times 15$.— H. Scale with seeds, nat. size.— I. Scale with bract, nat. size. — *ABIES GUATEMALENSIS* Rehd. J. Leaf, $\times 3$.— K. Cross-section of leaf $\times 15$.— L. Scale with seeds, nat. size.— M. Scale with bract, nat. size.

Folia subdisticha, sub angulo fere recto patentia, linearia, 1.2–2.6 cm. longa et circiter 1.25 mm. lata, apice obtusa et emarginata, supra pallide viridia, sulcata, subtus cinereo-viridia, costa media leviter elevata, fasciis stomatiferis vix conspicuis e seriebus stomatum 7–8 compositis; canales resiniferi 4–8 (raro 10), 2–4 (raro 5) in folii facie inferiore subepidermales 1–4 (raro 5) in parenchymate partis superioris folii siti; hypoderma bene evolutum sed hic inde interruptum in foliis ramuli fertillis, minus conspicuum in eis ramuli sterilis; fasces fibro-vasculares 2, bene distincti. Strobili subsessiles, maturi oblongo-cylindrici, 6–7 cm. longi et 2.5–3.5 cm. diam., obscure brunnei, apice obtusi; bractea oblongo-lanceolatae, circ. 2 cm. longae et 6–7 mm. latae, sensim in apicem acuminatum attenuatae, squamam multo superantes, erectae, incurvae et strobilo accumbentes vel leviter patentis, margine inaequaliter incisoserrulatae; squamae late cuneato-obovatae, 1.4–1.5 cm. altae et 1.8–2 cm. latae, margine extus hirtello-puberulae subito in stipitem circ. 4 mm. longum contractum, alis leviter recurvis et plus minusve auriculatis margine eroso-denticulatis. Semina 6–7 mm. longa, alis subtundatis squamam fere aequantibus circ. 7 mm. longis et 8–9 mm. latis.

MEXICO. Oaxaca: Alt. 1650 m., *C. Conzatti* in 1900 (type in herb. Bonaparte, Lab. Bot. Lyon, sterile); Cerro de Yalina, alt. 3000 m., *C. Conzatti* 951, June 1899 (G.H.); San Juan del Estado, Distr. da Etla, *C. Conzatti*, Apr. 8, 1938 (sterile); Cerro San Felipe, Distr. dal Centro, alt. 2500–3000 m., *C. Conzatti*, Apr. 8, 1938 (sterile); Itepeji, Sierra Juarez, Mt. San Felipe, alt. 2500 m., *J. H. Faull* 13268, 13269, Dec. 5, 1938 (with cones); Rancho Tablas, Distr. de Ixtlan, alt. 2500 m., *J. H. Faull* 13274, Dec. 7, 1938 (with cones) (all in herb. A.A.). Vera Cruz: Orizaba, *Botteri* 225, about 1855 (G.H.).

This species was first described in 1932 by Flous and Gaussen, based on a sterile branch collected by *C. Conzatti* in 1900. As complete material is now available, cones having been collected by Dr. J. H. Faull last year, a full Latin description is given above. The species is readily distinguished from *A. religiosa* by the emarginate leaves with 4–8 resin-canals, the smaller cones with oblong-lanceolate bracts exceeding the scales and directed upward and more or less incurved or sometimes slightly spreading, but never reflexed as in *A. religiosa*. From the following species which also has emarginate leaves, it differs in the smaller cone with exserted bracts and in the leaves with 4–8, rarely 10, resin-canals partly subepidermal and partly situated in the parenchyma near the upper surface of the leaf, and in the less copious hypoderm. The species seems to be restricted to the central mountains of Oaxaca occupying an area situated between that of *A. religiosa* and the following

species. The locality "Orizaba" of Botteri's specimen¹ seems doubtful, for two other collections cited above under *A. religiosa* from the Peak of Orizaba represent the latter species; it is unlikely that both species are growing on the Peak of Orizaba which is well within the range of *A. religiosa*, being in the same latitude as the stations in the District of Mexico and of Pueblo. It is possible that part of the specimens collected by Botteri came from Oaxaca, for Hemsley mentions (Biol. Centr. Am. Bot. 4: 133) that a small collection of Mexican plants from Professor Sumichrast of Tehuantepec in Oaxaca, was presented in 1877 to Kew by De Candolle, which bears the same numbers for the same species as Botteri's. Tehuantepec is situated about 70 miles southeast of the mountains where *A. Hickeli* is found.

***Abies guatemalensis*, spec. nov.**

FIG. 1, J-M

Abies, sp. n. ? Hemsley, Biol. Centr.-Am. Bot. 4: 89 (1887), nom. nud.

Arbor ad 35 m. alta, trunco 60-90 cm. diam. (ex coll. A. F. Skutch) ramuli fusco-brunnei, pulvinis linearibus sulcati, steriles sat dense, fructiferi sparsius hirtelli; gemmae globoso-ovoideae, valde resinosa. Folia subdistichia, sub angulo fere recto patentia, inaequalia, linearia, 1.5-3 cm. longa et 1.25-2 mm. lata, apice obtusa et emarginata, supra laete viridia, nitidula, sulcata, subtus costa media elevata, marginibus recurvis, fasciis stomatiferis satis conspicuis e seriebus stomatum 8-10 compositis; canales resiniferi 2, subepidermales; hypoderma bene evolutum hic inde interruptum; fascies fibro-vasculares 2, approximati sed distincti. Strobili subsessiles, oblongo-cylindrici, 8.5-11.5 cm. longi et 4.5-5 cm. diam.; bracteae cuneato-obovatae, inclusae et dimidiam squamam aequantes, apice late truncatae et eroso-denticulatae, in medio paullulo vel vix productae; squamae transverse oblongae, circ. 3 cm. latae et 2-2.2 cm. altae, margine extus hirtello-puberuli, alis inaequaliter eroso-denticulatis, basi auriculata et in stipitem 5-6 mm. longum subito contractae; semina cuneato-obovoidea, 8-9 mm. longa, pallide brunnea, alis obovatis 1-1.5 cm. longis et 1.4-1.5 cm. latis.

GUATEMALA. Without special locality, *G. U. Skinner*, about 1850; Mts. above Sija (Totonicapam), *O. F. Cook* 33, May 24, 1906 (U.S., ♂ fls.); Cumbre del Aire, Dept. Totonicapam, alt. 10000 ft., *A. F. Skutch* 1279, Sept. 20, 1934 (sterile); Las Cumbres de Totonicapam, alt. 11000 ft., *J. H. Faull*, Dec. 25, 1936 (sterile); Las Cumbres del Aire, between Quezaltenango and Huehuetenango, alt. 11000 ft., *J. H. Faull*, Dec. 31, 1936 (A.A. with immature cones); Las Cumbres del Aire,

¹Mateo Botteri collected 1193 numbers in southern Mexico about the year 1855, (see Bonplandia, 5: 72. 1857).

Huehuetenango, elev. 10000 ft., *J. H. Faull 13104*, Dec. 14, 1937 (type in A.A. with cones).

This species is readily distinguished from *A. religiosa* by the emarginate and pectinately arranged leaves, and from both preceding species by the bracts being only half as long as the scales, truncate at the apex and entirely hidden between the scales. In the pectinately arranged leaves and in their emarginate apex, it agrees with *A. Hickeli*, but differs from it in the broadly obovate bracts truncate at the apex and only about half as long as the scale, and in the leaves having only two resin canals. Both species, *A. Hickeli* and *A. guatemalensis* are easily distinguished, even without cones, from *A. religiosa* by the pectinately spreading emarginate leaves, while in the latter they are on the upper surface of the branch, directed forward and more or less appressed to the branch and always acute or obtusish at the apex, never emarginate.

Abies guatemalensis, which so far is known only from a restricted area near Lake Atitlan in the high mountain range along the western coast of Guatemala, marks the southernmost extension of the range of the whole genus, occurring as it does, between 14° and 15° N. lat., while in Asia and Africa, it does not even reach the Tropic of Cancer. The Guatemalan species seems to have been collected first by George U. Skinner¹ who sent a specimen from Guatemala to J. D. Hooker before 1866, which is cited by Parlatore under *Pinus religiosa* (l. c.).

The references to the occurrence of *Abies religiosa* in Guatemala by later authors are probably all based on this citation. Skinner's specimen in the Kew Herbarium which was kindly sent to me for examination, bears on the sheet besides *A. religiosa* on the original label, also the name *A. hirtella* and annotations by several authors, all doubting the identity of the specimen with *A. religiosa*. A note by J. D. Hooker says "leaves notched at apex" and a similar statement is made in an unsigned note. A note by Wm. R. McNab states that "this differs from *religiosa* in having only a few large hypoderm cells under the epidermis. I believe therefore that *hirtella* is distinct from *religiosa*." There are references by McNab to this specimen in a paper of his in Proc. Roy. Irish Acad. II, 2: 676 (1877) and in Trans. Scott. Arb. 8: 97 (1878). There is also a note "not religiosa, Dr. Mayr." These notes may have induced Hemsley to enumerate it as *Abies* sp. n. ? (l. c.). More recently, in 1934, it was again collected by A. F. Skutch, but also without cones. The real nature of the Guatemalan fir was not recognized until Dr. J. H. Faull collected for the Arnold Arboretum in 1936 excellent

¹For a biographical sketch see Trans. Soc. Bot. Edinb. 9: 91-99 (1868) and Gard. Chron. 1867: 180-181.

material with mature cones which enabled us to recognize this fir as a new species.

Abies concolor (Gord.) Engelm. in Trans. St. Louis Acad. Sci. **3**: 600 (Syn. Am. Firs) (1878); repr. p. 8 (1878); in Trelease & Gray, Bot. Works Engelm. 345 (1887).

Abies concolor Lindley & Gordon in Jour. Hort. Soc. Lond. **5**: 210 (1850), nom. nud.

Pinus concolor Engelm. ex Lindley & Gordon, l. c. (1850), pro synon. praeced.

Picea concolor Gordon, Pinet 155 (1858).

Pinus concolor Engelm. herb. ex Parlatore, in DC. Prodr. **16**²: 426 (1868).

Abies grandis var. *concolor* A. Murray in Gard. Chron. n. ser. **3**: 105 (1875).

MEXICO. Lower California: San Pedro Martir, T. S. Brandegee, May 24, 1893 (A.A.); Vallecitos, Sierra San Pedro Martir, alt. 8060 ft., I. L. Wiggins & D. Demaree 4979, Sept. 21, 1930; trees mostly less than 10 ft. tall (G.H.).

This species is widely distributed throughout the Rocky Mountain region from Colorado to Oregon, south to New Mexico and southern California, but in Mexico it has been found only in northern Lower California on the San Pedro Martir Mountain where it was discovered in 1893 by T. S. Brandegee (cf. *Zoe*, **4**: 210. 1893); the specimens from the San Pedro Martir Mountain differ from typical *A. concolor* in the leaves being more or less curved, thicker, and only 1.5–3 cm. long.

As authors of the name *A. concolor* usually Lindley and Gordon are cited, but they published no description and only cited the unpublished *Pinus concolor* Engelm. as a synonym. The first, though rather brief description is given by Gordon under *Picea concolor*; he only says: "Leaves, long, linear, flat and much resembling those of *Picea grandis* but with both faces of the leaves of the same colour. Cones, cylindrical." Should this not be considered a sufficient description, the parenthetical author would be Parlatore.

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PLANTAE KRUKOVIANAE VI¹

A. C. SMITH

THE PRESENT PAPER is based primarily upon plants collected in Amazonian Brazil by Mr. B. A. Krukoff. The first set of his collections, including the types of new species here described, is deposited in the herbarium of the New York Botanical Garden. The first set of duplicates is deposited at Harvard University (woody plants at the Arnold Arboretum, herbaceous plants at the Gray Herbarium). Other duplicate sets are widely distributed in American and European institutions.

ARACEAE

Philodendron ampletens A. C. Smith, sp. nov.

Planta epiphytica scandens; caudice gracili verruculis minutis asperato, 4-8 mm. crasso, ad nodos radicante, internodiis elongatis 18-22 cm. longis; petiolis supra leviter canaliculatis siccitate striatis, verruculis minutis densissime obtectis, basi vagina decidua circiter 2 cm. longa instructis, 7-11 cm. longis; laminis coriaceis anguste oblongo-deltaideo-sagittatis, 11-15 cm. longis, basi 5.5-7.5 cm. latis, apice breviter acuminatis, lobis posticis oblongis apice rotundatis circiter 4 cm. longis et 2.5 cm. latis sinu lato parabolico sejunctis, nervis lateralibus primariis costalibus quam secundariis atque tertiariis vix crassioribus, basalibus 2 paullo validioribus, nervo colectivo a margine circiter 1 mm. remoto; pedunculo tereti 4-4.5 cm. longo; spatha ovato-oblonga medio leviter constricta, 9.5-10 cm. longa, expansa 4-5.5 cm. lata, convoluta 1.5-2 cm. diametro, apice breviter apiculata; spadice conspicue stipitato (stipite circiter 15 mm. longo et 4 mm. diametro) quam spatha paullo brevior, inflorescentia feminea circiter 2.5 cm. longa, 6-8 mm. crassa, mascula 4-4.5 cm. longa apice obtusa; pistillo subcylindrico circiter 3 mm. longo et 1.5 mm. diametro, 3- vel 4-loculari, multiovulato, stigmate truncato coronato; floribus masculis 3- vel 4-andris, circiter 2 mm. longis.

Type, *Krukoff 7250*, collected Nov. 15, 1934, on margin of Rio Ipixuna between Monte Christo and Santa Victoria, Municipality Humayta,

¹Previous papers in this series have been published as follows:

- I: Bull. Torrey Club **60**: 349-365, 379-396. *pl. 21, 22*. 1933.
- II: Bull. Torrey Club **61**: 191-196. 1934.
- III: (by H. A. GLEASON): Phytologia **1**: 106-111. 1934.
- IV: Phytologia **1**: 113-126. 1935.
- V: Brittonia **2**: 145-164. 1936.

basin of Rio Madeira, Amazonas. A species of Engler's Section POLYSPERMIMUM, it is related to *P. Jenmanii* Krause and *P. scabrum* Krause, particularly resembling the latter by its scabrid petiole. Than either of these species, however, *P. amplexens* has a much narrower leaf blade and a longer inflorescence stipe. *Philodendron scabrum* has a comparatively short spadix and the pistil is described as several-loculed.

Philodendron solimoensis A. C. Smith, sp. nov.

Planta epiphytica; petiolis siccitate valde striatis basi teretibus apicem versus supra leviter canaliculatis, circiter 45 cm. longis, inferne 6–7 mm. diametro; laminis coriaceis oblongo-sagittatis, 40–55 cm. longis, basin versus 20–23 cm. latis, lobis posticis triangulari-oblongis sinu profundo acuto distantibus, 19–20 cm. longis, ad 12 cm. latis, apice obtusis, lobo antico oblongo-triangulari apice obtusis, nervis lateralibus primariis utroque circiter 4 a costa patentibus quam secundariis atque tertiariis multo validioribus, basalibus 2 in costulas in sinu longe (3–4 cm.) denudatas conjunctis, nervis secundariis et tertiariis prominulis in nervum collectivum a margine circiter 0.5 mm. remotum conjunctis; pedunculo 5–6 mm. crasso ut videtur brevi; spatha siccitate coriacea apice acuta medio leviter constricta, circiter 20 cm. longa, convoluta 2.5–4 cm. diametro; spadice stipite brevi suffulto, inflorescentia feminea circiter 8 cm. longa et 2–2.5 cm. diametro, mascula circiter 8 cm. longa et 1.5 cm. diametro, apice obtusa; baccis subcylindricis, 7–9 mm. longis, 5–6 mm. diametro, 5-locularibus, stigmatibus subrotundatis coronatis.

Type, *Krukoff 8861*, collected Oct.–Dec., 1936, on terra firma in basin of Creek Belem, Municipality São Paulo de Olivença, basin of Rio Solimoes, Amazonas. A species of Engler's Section POLYSPERMIMUM, it is remarkable for the elongate-triangular basal lobes of its sagittate leaves. From *P. maculatum* Krause, a near ally, the new species differs in foliage and also in its substantially larger inflorescence.

Heteropsis linearis A. C. Smith, sp. nov.

Caudex alte scandens; ramulis crassis striatis nigrescentibus 3–5 mm. crassis, teretibus vel apicem versus paulo complanatis, internodiis 2–4 cm. longis; petiolis 1.5–2 mm. crassis striatis supra canaliculatis 3–7 mm. longis; laminis rigide coriaceis linearibus vel angustissime oblongis saepe falcatis, 15–22 cm. longis, 1.8–2 cm. latis, basi attenuatis, apice acutis vel calloso-apiculatis, margine crassis et leviter recurvatis, nervis lateralibus numerosis valde adscendentibus utrinque distincte prominulis prope marginem conjunctis; ramulis floriferis brevibus terminalibus; pedunculo tereti conspicue striato 8–10 mm. longo; spatha non visa; spadice (stipite 6–7 mm. longo suffulto) in siccitate nigrescente oblongo, florifero circiter